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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/451,619 11/30/99 MORI

S 005702-20050

EXAMINER

MM91/0921

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ART UNIT

PAPER NUMBER

2814

DATE MAILED:

09/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/451,619

Applicant(s)

MORI, SEIICHI

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Attorney's Docket Number: 005702-20050

Filing Date: 11/30/99

Continuing Data: none

Claimed Foreign Priority Date: 11/30/98 (JPX)

Applicant(s): Mori

Examiner: Howard Weiss

Election/Restrictions

1. Applicant's election of Group I, Claims 1 to 6, in Paper No. 6 is acknowledged. Claims 7 to 18 have been canceled.

Information Disclosure Statement

2. The information disclosure statement filed 5/8/00 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the listed patent application is not a published document readily available to the public at large, the relevance of the document was not stated and a copy of the document was not provided. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "7" has been used to designate both the source region and the sidewall spacers in Figure 1. Correction is required.

4. Figure 5 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
6. The disclosure is objected to because of the following informalities:
- a. On Page 4 Line 10, "o" should be changed to ---or---;
 - b. On Page 9 Line 35 and Page 10 Line 10, numbers expressed in scientific notation should be written as powers of ten. For example; "2E15" should be changed to --- 2×10^{15} ---;
 - c. On Page 15 Line 6, it is unclear what "ana res" means.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1 to 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Applicant describes the source region to be introduced by an impurity self-aligned with a side wall provided in the control gate (Claim 1) and further by a dual layer side wall (Claim 6). However, neither the Specification nor the Figures show an aligned source region. Figure 2E shows the source region 8 overlapping underneath the sidewall 7. Additionally, this limitation is an intermediate process step and will be treated as "product-by-process" (see rejection below).

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 2 recites the limitation "said impurity dose quantity" in Line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102/103

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Initially, and with respect to Claims 1, 2 and 6, note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).

Note that Applicant has burden of proof in such cases as the above case law makes clear.

15. Claims 1 to 3 are rejected under 35 U.S.C. § 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Lu et al.

Lu et al. show all aspects of the instant invention (e.g. Figure 1 and Column 5 Lines 15 to 41) including:

- a semiconductor substrate **104**
- a source region **120** and a drain region **118a**
- a floating gate **100, 108** provided on an insulating layer **102**
- the overlap of said drain region with the floating gate is larger than the overlap of said source region
- the erasing and writing procedures are as claimed (Column 4 Line 27 to Column 5 Line 13)

As to the grounds of rejection under section 103(a), how the source region is made (by self-alignment with a side wall or by another means) and what impurity dose quantity was used are intermediate process steps and does not affect the final device structure as claimed. See MPEP § 2113 which discusses the handling of "product by process" claims and recommends the alternative (§ 102/103) grounds of rejection.

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Okuda et al.

Lu et al. show most aspects of the instant invention (Paragraph 14) except for the electric charge accumulating portion being an insulating layer having trap level therein. Okuda et al. teach (e.g. Figures 1(a,b)) to use trap layers **11, 12, 14,15** to provide a low-voltage and high data performance device (Column 2 Lines 52 to 61). It would have been obvious to a person of ordinary skill in the art at the time of invention to use trap layers as taught by Okuda et al. in the device of Lu et al. to provide a low-voltage and high data performance device.

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Kume et al.

Lu et al. show most aspects of the instant invention (Paragraph 14) except for source junction depth being larger than the drain junction depth. Kume et al. teach (e.g. Figure 1) to have the source junction depth larger than the drain junction depth to make it possible to apply a high erase voltage (Page 560 Column 2 second paragraph). It would have been obvious to a person of ordinary skill in the art at the time of invention to have the source junction depth larger than the drain junction depth as taught by Kume et al. in the device of Lu et al. to make it possible to apply a high erase voltage.

18. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Sung et al.

Lu et al. show most aspects of the instant invention (Paragraph 14) except for the a side wall on said control gate made of two layers. Sung et al. teach (e.g. Figures 1A and 3A) to have the side wall on the control gate **14** to have two layers **28, 29'** to reduce the number of source pickups (Column 1 Lines 28 to 30). It would have been obvious to a person of ordinary skill in the art at the time of invention to have the side wall on the control gate to have two layers as taught by Sung et al. in the device of Lu et al. to reduce the number of source pickups.

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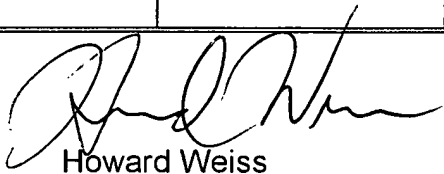
Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prall et al., Komori et al. and IBM TDB 1993 disclose devices with asymmetric source/drain regions.
20. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.
- Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

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22. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 315, 324; 438/288	9/19/01
Other Documentation: PLUS Analysis Report	9/12/01
Electronic Database(s): EAST (USPAT)	9/19/01



Howard Weiss

Patent Examiner

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19 September, 2001